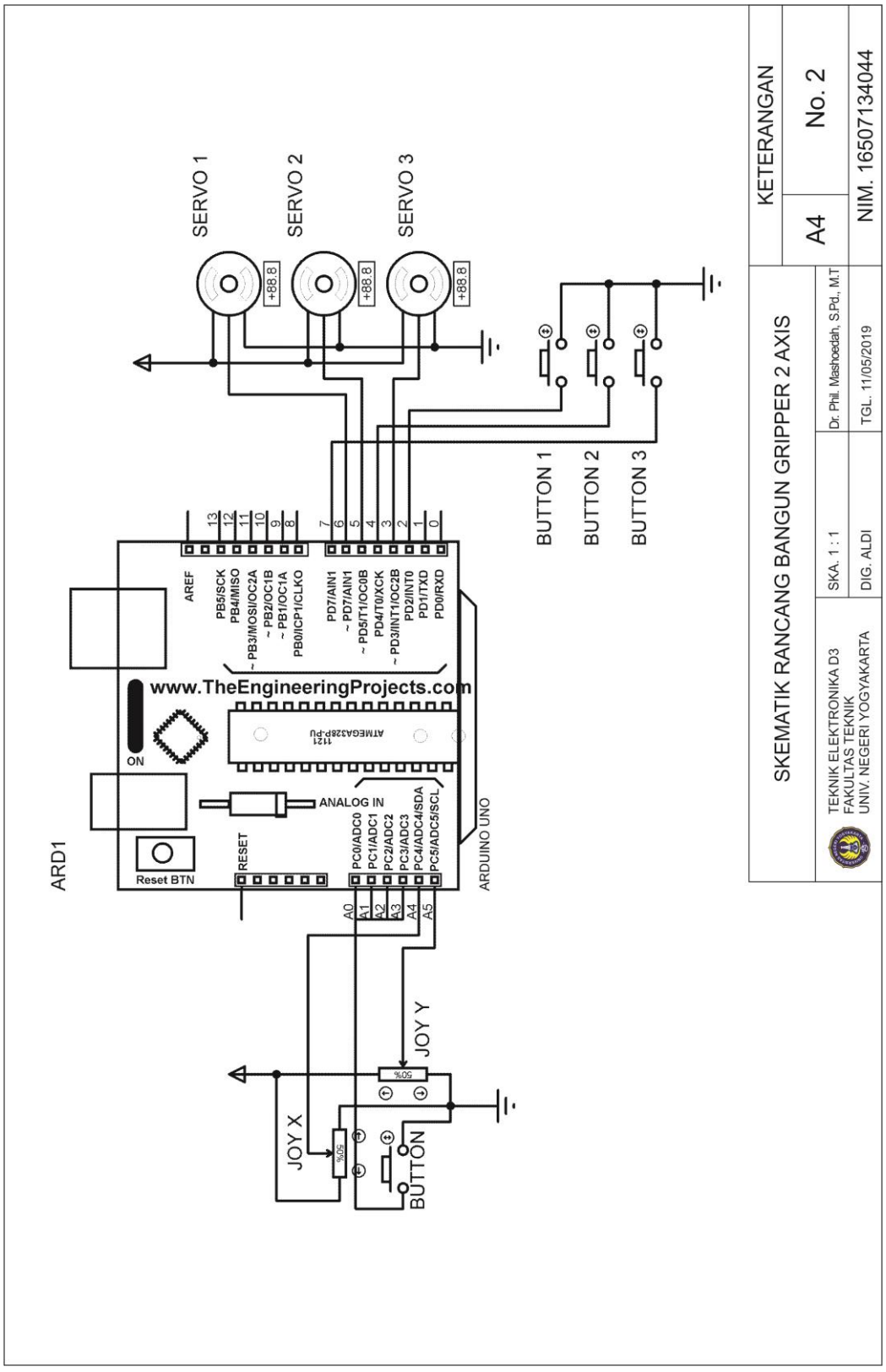
Lampiran 1 Skema Rangkaian



Lampiran 2 Program

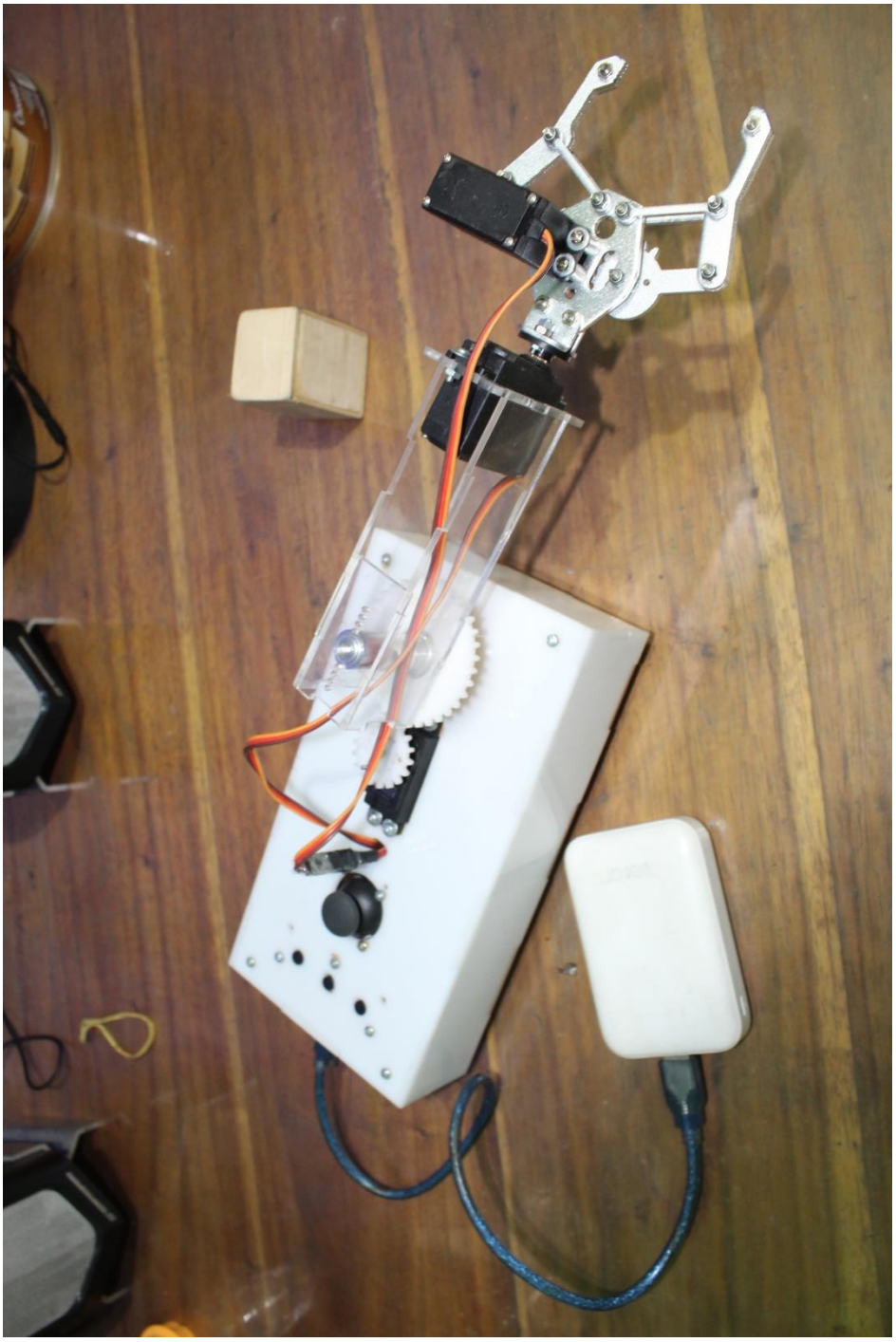
```
#include <Servo.h>
//switch pin 12
//vrx A5  vry A4
// pin digital 2 4 7
// pin pwm 3 5 6
Servo serv1, serv2, serv3; // membuat objek pengendali servo
int joyX              = A5; // analog pin untuk menghubungkan pada joy X di modul
Joystick
int joyY              = A4; // analog pin untuk menghubungkan pada joy X di modul
Joystick
int switchUpGripper    = 12;
int switchResetBahu    = 2;
int switchResetLengan  = 4;
int switchResetGripper = 7;
int buttonUpGripper      = 0;
int buttonResetBahu      = 0;
int buttonResetLengan    = 0;
int buttonResetGripper   = 0;
int b, x, y, z;
void setup()
{
  pinMode(switchUpGripper, INPUT_PULLUP);
```

```
  pinMode(switchResetBahu, INPUT_PULLUP);
  pinMode(switchResetLengan, INPUT_PULLUP);
  pinMode(switchResetGripper, INPUT_PULLUP);
  serv1.attach(6); // gripper
  serv2.attach(5); // lengan
  serv3.attach(3); // bahu
  Serial.begin(9600);
  x = 100;
  y = 175;
  z = 10;
  b = 3;
}
void loop(){
  joyX = analogRead(A5);
  joyY = analogRead(A4);
  buttonUpGripper      = digitalRead(switchUpGripper);
  buttonResetBahu      = digitalRead(switchResetBahu);
  buttonResetLengan    = digitalRead(switchResetLengan);
  buttonResetGripper   = digitalRead(switchResetGripper);

  if(joyX > 600 ){
     x = x + b;
     }
```

```
else if (joyX < 300 ){
 x = x - b;
}
else if(buttonResetBahu==0){
 x = 100;
}
else if(joyY > 800 ){
  y = y - b;
   }
else if (joyY < 200 ){
 y = y + b;
}
else if(buttonResetLengan==0){
 y = 175;
}
else if (buttonUpGripper==0){
  z = z + b;
}
else if(buttonResetGripper==0){
  z = 10;
}

Serial.print("x = ");
```

```
Serial.print(x);
Serial.print("   joyX = ");
Serial.print(joyX);
Serial.print("    y = ");
Serial.print(y);
Serial.print("   joyY = ");
Serial.print(joyY);
Serial.print("   Gripper = ");
Serial.print(buttonUpGripper);
Serial.print("   Gripper= ");
Serial.println(z);
serv1.write(z);
serv2.write(x);
serv3.write(y);
delay(15);
}
```

Lampiran 3. Foto Alat



Lampiran 4 Datasheet Servo MG995

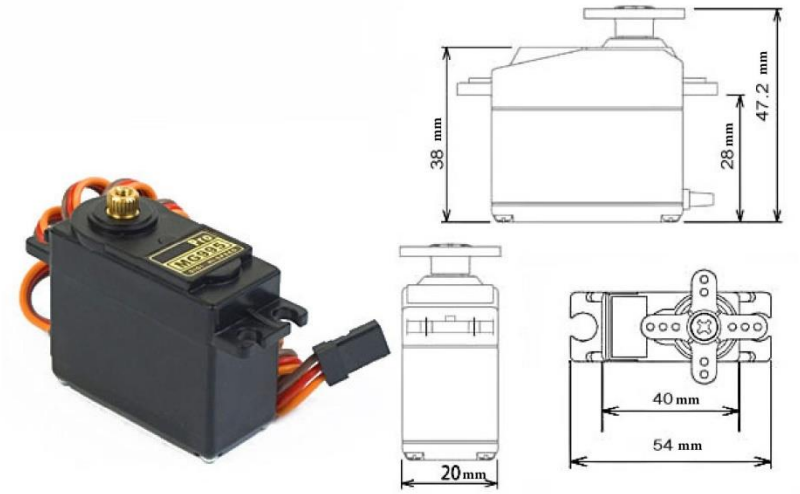
31150-MP
MG995 High Speed Servo Actuator

The unit comes complete with color coded 30cm wire leads with a 3 X 1 pin 0.1" Pitch type female header connector that matches most receivers, including Futaba, JR, GWS, Cirrus, Blue Bird, Blue Arrow, Corona, Berg, Spektrum and Hitec.

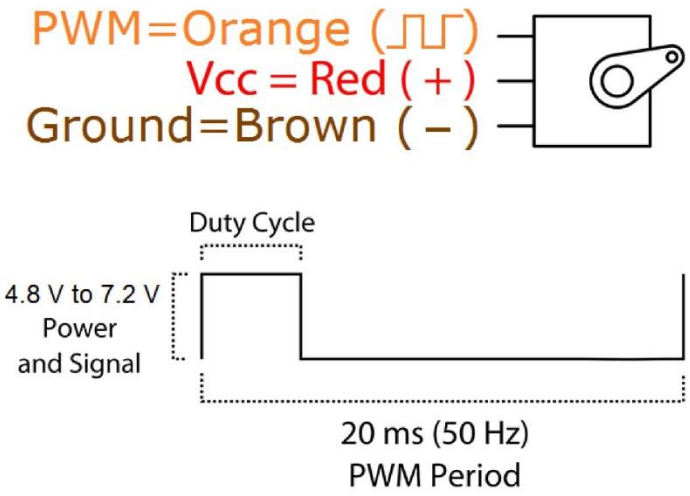
This high-speed servo actuator is not code dependant; You can use any servo code, hardware or library to control them. The MG995 Actuator includes arms and hardware to get started.

Specifications

- Weight: 55 g
- Dimension: 40.7 x 19.7 x 42.9 mm approx.
- Stall torque: 8.5 kgf·cm (4.8 V), 10 kgf·cm (6 V)
- Rotation Angle: 120deg. (+- 60 from center)
- Operating speed: 0.2 s/60º (4.8 V), 0.16 s/60º (6 V)
- Operating voltage: 4.8 V to 7.2 V
- Dead band width: 5 µs
- Stable and shock proof double ball bearing design
- Metal Gears for longer life
- Temperature range: 0 ºC – 55 ºC



31150-MP
MG995 High Speed Servo Actuator



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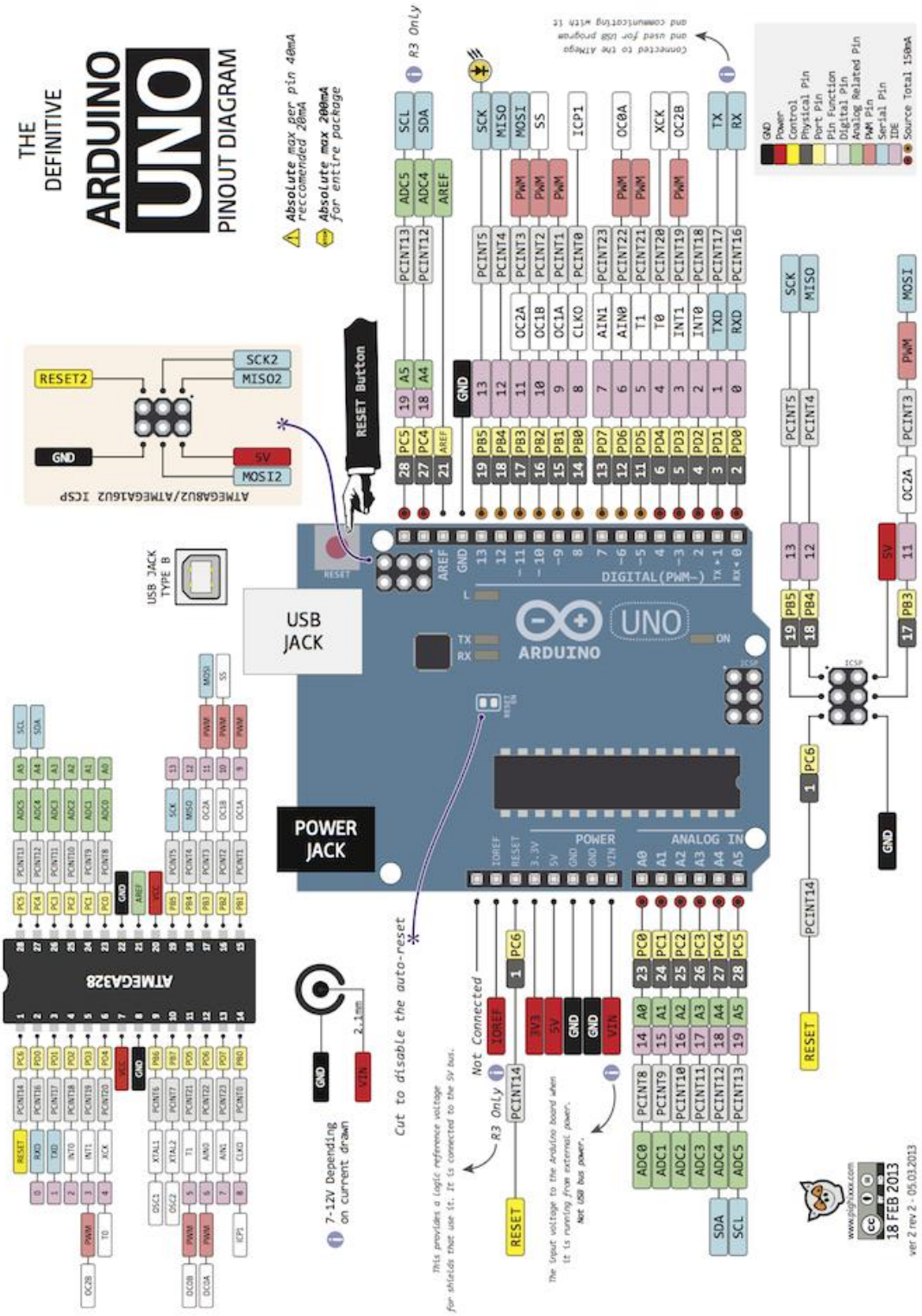
Lampiran 5 Motor Arduino UNO



Pin Description

Pin Category	Pin Name	Details
Power	Vin, 3.3V, 5V, GND	Vin: Input voltage to Arduino when using an external power source. 5V: Regulated power supply used to power microcontroller and other components on the board. 3.3V: 3.3V supply generated by on-board voltage regulator. Maximum current draw is 50mA. GND: ground pins.
Reset	Reset	Resets the microcontroller.
Analog Pins	A0 – A5	Used to provide analog input in the range of 0-5V
Input/Output Pins	Digital Pins 0 - 13	Can be used as input or output pins.
Serial	0(Rx), 1(Tx)	Used to receive and transmit TTL serial data.
External Interrupts	2, 3	To trigger an interrupt.
PWM	3, 5, 6, 9, 11	Provides 8-bit PWM output.
SPI	10 (SS), 11 (MOSI), 12 (MISO) and 13 (SCK)	Used for SPI communication.
Inbuilt LED	13	To turn on the inbuilt LED.
TWI	A4 (SDA), A5 (SCA)	Used for TWI communication.
AREF	AREF	To provide reference voltage for input voltage.

Arduino Uno Technical Specifications

Microcontroller	ATmega328P – 8 bit AVR family microcontroller
Operating Voltage	5V
Recommended Input Voltage	7-12V
Input Voltage Limits	6-20V
Analog Input Pins	6 (A0 – A5)
Digital I/O Pins	14 (Out of which 6 provide PWM output)
DC Current on I/O Pins	40 mA
DC Current on 3.3V Pin	50 mA
Flash Memory	32 KB (0.5 KB is used for Bootloader)
SRAM	2 KB
EEPROM	1 KB
Frequency (Clock Speed)	16 MHz

Lampiran 6 Modul *Joystick* 2 Axis

JOYSTICK MODULE

Description

Lots of robotic projects need a joystick. This module offers an affordable solution to that. The Joystick module is similar to analog joysticks found in gamepads. It is made by mounting two potentiometers at a 90 degrees angle. The potentiometers are connected to a short stick centered by springs.

This module produces an output of around 2.5V from X and Y when it is in resting position. Moving the joystick will cause the output to vary from 0v to 5V depending on its direction. If you connect this module to a microcontroller, you can expect to read a value of around 512 in its resting position (expect small variations due to tiny imprecisions of the springs and mechanism) When you move the joystick you should see the values change from 0 to 1023 depending on its position.

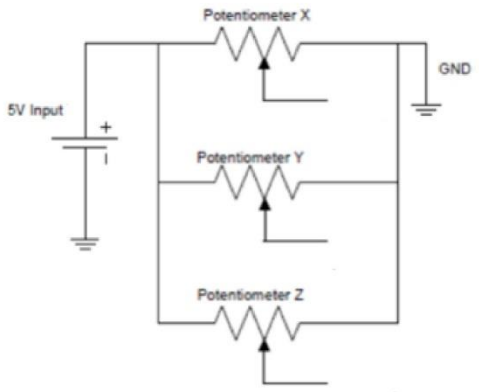
Specifications

- Directional movements are simply two potentiometers - one for each axis
- Compatible with Arduino interface
- The biaxial XY Joystick Module KY-023 applies ARDUINO
- Dimensions: 1.57 in x 1.02 in x 1.26 in (4.0 cm x 2.6 cm x 3.2 cm)
- 5 Pin
- Color: Black

Pin Configuration

1. GND: ground
2. +5V: 5V DC
3. VRx: voltage proportional to x position
4. VRy: voltage proportional to y position
5. SW: switch pushbutton

Schematic Diagram



Wiring Diagram